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INFORMATION TERMINAL DEVICE WITH DISPLAY-ILLUMINATING MEANS

FIELD OF THE INVENTION

This invention relates to a portable-type information terminal device such as a so-called electronic notebook and the like.

BACKGROUND OF THE INVENTION

A portable-type information terminal device such as a so-called electronic notebook and the like is generally provided with a display on the main body and a foldable lid for protecting this display.

Although some of this type of portable information terminal devices are provided with no illuminating means to illuminate the display, the display is generally provided with a backlight at the bottom side since it is difficult to use it at night or at a dark place without any illuminating means for display.

Here, conventional information terminal devices with a backlight at the bottom side of display use a light-transmitting type member, such as a liquid-crystal display plate, as a display, providing with a light source at the bottom side of the display so as to illuminate the display from the back side.

In such a backlight type, since the distance from the light source to the display is very short, a plate-like illuminating-light dispersing lens called light-guiding plate is generally used to illuminate the whole part of display, so that light from the light source can be dispersed.

Also, other than such a backlight type, suggested is a terminal device that is provided with a light source such as LED at the sides of display so as to illuminate directly the surface by supplying light in the lateral direction to the display.

However, since the conventional terminal device with a backlight type of illuminating means is equipped with the light source and the light-guiding plate for dispersing illuminating-light at the bottom side of display, the thickness of device main body must increase by a thickness of the light and the light-guiding plate and the weight also must increase by that of them.

Thus, the backlight type must incur an increase in thickness and weight of the entire device, by reason of its structure. So, it has been a serious problem especially to portable type information terminal devices that the total thickness, size and weight are needed to decrease.

On the other hand, though the type that light is supplied from the sides to the display does not incur an increase in thickness of device itself, it is difficult to illuminate uniformly the entire display since light in the lateral direction is supplied to the surface of display. So, there occurs a problem that it is apt to lack in uniformity of brightness, thereby causing a reduction in visual performance on display, depending on the number and position of light sources provided.

Meanwhile, Japanese patent application laid-open No. 63-237115 (1988) discloses a compact electronic calculator that a display is installed rotatably so that it eliminates the need for a protective lid. However, though this teaches means to allow the display to rotate, it discloses no particular illuminating means and therefore gives no solution to the above problems.

Also, Japanese patent application laid-open No. 6-119090 (1994) discloses a power-saving control method that a

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device is switched into power-saving mode when it is not used. However, this relates to saving consumed power by switching into power-saving mode and does not describe about means for illuminating the display. So, this gives no solution to the above problems.

SUMMARY OF THE INVENTION

Accordingly, it is an object of the invention to provide an information terminal device that can be thinned and lightened.

It is a further object of the invention to provide an information terminal device that the display can be illuminated uniformly.

According to the invention, an information terminal device, comprises:

a display

a lid for covering the display, the lid being allowed to fold up and unfold freely, and

means for illuminating the display from above provided on the lid.

BRIEF DESCRIPTION OF THE DRAWINGS

The invention will be explained in more detail in conjunction with the appended drawings, wherein:

FIGS. 1A and 1B are general perspective views showing an information terminal device with display-illuminating means in a first embodiment according to the invention, in detail,

FIG. 1A shows a state that the illuminating means is turned off and

FIG. 1B shows a state that the illuminating means is turned on,

FIG. 2 is a block diagram showing a controller of the information terminal device with display-illuminating means in the first embodiment,

FIG. 3 is a flow chart showing the operation of the information terminal device with display-illuminating means in the first embodiment,

FIGS. 4A and 4B are general perspective views showing an information terminal device with display-illuminating means in a second preferred embodiment according to the invention, in detail,

FIG. 4A shows a state that the illuminating means is turned off and

FIG. 4B shows a state that the illuminating means is turned on,

FIGS. 5A to 6B are enlarged partial views showing the illuminating means in the turn-on and turn-off states in the information terminal device with display-illuminating means in the second embodiment, in detail,

FIGS. 5A and 6A are partial perspective views and

FIGS. 5B and 6B are partial cross sectional side views, and

FIG. 7 is a block diagram showing a controller of the information terminal device with display-illuminating means in the second embodiment.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

Information terminal devices with display-illuminating means in the preferred embodiments will be explained below, referring to the drawings.